REMARKS

Applicants would first like to thank the Examiner for granting a telephone interview on September 13, 2005 regarding the above-identified application. The Examiner's remarks were most helpful to the Applicants.

Claims 7, 8 and 10-17 are pending in the above-identified application. Claims 7, 8 and 10-17 were rejected.

With this Amendment, claims 7 and 17 were amended. Accordingly, claims 7, 8, 10-17 are at issue in the above-identified application.

35 U.S.C. § 103 Obviousness Rejection of Claims

Claims 7, 8, 10-13, 16 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Narang et al.* (U.S. Patent No. 6,168,885) in view of *Schneider et al.* (U.S. Patent No. 6,180,281) in view of *Gozdz et al.* (U.S. Patent No. 5,840,087) in view of *Kawakami et al.* (U.S. Pre-Grant Publication No. 2002/0064710). Claims 14 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Narang et al.* in view of *Schneider et al.* in view of *Gozdz et al.* in view of *Kawakami et al.* as applied to claims 7-13, 16, and 17 above, and further in view of *Oliver et al.* (U.S. Patent No. 5,688,293).

Amended claim 7, from which claims 8, 10-16 and 18 depend, recites a method of manufacturing a solid-electrolyte battery comprising forming solid-electrolyte layers on both sides of a positive electrode; forming solid-electrolyte layers on both sides of a negative electrode; laminating said positive electrode and said negative electrode such that one of said solid-electrolyte layers formed on said positive electrode and one of said solid-electrolyte layers formed on said negative electrode face each other; winding said positive electrode and said

negative electrode such that another one of said solid-electrolyte layers formed on said positive electrode and another one of said solid-electrolyte layers formed on said negative electrode face each other; and subjecting said wound electrodes to heat treatment at about 70°C so that said solid-electrolyte layers formed on said positive electrode and said solid-electrolyte layers formed on said negative electrode are integrated with each other into one continuous seamless layer.

Amended claim 17 also recites a method of manufacturing a solid-electrolyte battery comprising: forming solid-electrolyte layers on both sides of a positive electrode and a negative electrode, wherein one of said solid-electrolyte layers formed on said positive electrode and one of said solid-electrolyte layers formed on said negative electrode face each other; winding said positive electrode and said negative electrode after pressing; and subjecting said wound electrodes to heat treatment at about 70°C so that said solid-electrolyte layers formed on said positive electrode and said solid-electrolyte layers formed on said negative electrode are integrated with each other into one continuous seamless layer.

Therefore, as claimed in claims 7 and 17, the solid-electrolyte layers formed on the positive electrode and one of the solid-electrolyte layers formed on the negative electrode are wounded facing each other, pressed and heated to form a seamless layer. As described in the specification, the positive electrode and the negative are wounded facing each other to form a continuous shape, which allows lithium ions to move more efficiently during performance. Lithium ions then can be easily doped to the negative or the positive electrode during a charging operation. (Specification, page 6. lines 19-20, page 7, lines 1-3). This, in turn, allows for greater energy density within the electrode or the battery and prevents the problem of internal short circuit caused by lithium deposits. (Specification, page 11, lines 11-12). Applicants' claimed method of manufacturing in claims 7 and 17 also comprises subjecting the wound electrodes to

heat treatment at about 70°C so that electrodes are integrated with each other into one continuous seamless layer. As seen from the examples, battery made without the heat treatment of the wound electrode has a poor discharge capacity. The heat treatment of the wound electrode at about 70°C allows the wound electrode to integrate the electrolyte layer formed on the positive and the negative electrode. (Specification, page 21, line 13, page 22, line 1, 19-23).

This is clearly unlike *Narang et al.* in view of *Schneider et al.* in view of *Gozdz et al.* and further in view of *Kawakami et al.*, which fails to disclose or even suggest forming solid-electrolyte layers on both sides of a positive electrode and a negative electrode; laminating the positive electrode and the negative electrode such that one of the solid-electrolyte layers formed on the positive electrode and one of the solid-electrolyte layers formed on the negative electrode face each other; winding the positive electrode and the negative electrode such that another one of the solid-electrolyte layers formed on the positive electrode and another one of the solid-electrolyte layers formed on the negative electrode face each other; and subjecting the wound electrodes to heat treatment at about 70°C so that the solid-electrolyte layers formed on the positive electrode and the solid-electrolyte layers formed on the negative electrode are integrated with each other into one continuous seamless layer. As stated in the Office action, *Narang et al.* teaches a process of making a battery comprising fabricating an electrode by mixing a current collector and electrolyte, but fails to discuss that 1) the electrode/electrolyte sheets are wound in the lengthwise direction of the sheets (i.e. that the laminate is spirally-wound); 2) the electrolyte layers are form into a "seamless" layer; 3) that both sides of the electrodes are coated with a electrolyte; and 4) that the temperature or duration of the lamination step. Therefore, the Examiner combines *Schneider et al.* in view of *Gozdz et al.* and further in view of *Kawakami et

al., with *Narang et al.*, however, Applicants submit that the combination still fails to disclose or suggest claims 7 and 17.

Schneider et al. teaches an electrode composite comprises a separator and an electrode embedded in a polymer matrix. However, *Schneider et al.* fails to teach a method of manufacturing a battery comprising forming solid-electrolyte layers on both sides of a positive electrode and negative electrode; winding the positive electrode and the negative electrode such that another one of the solid-electrolyte layers formed on the positive electrode and another one of the solid-electrolyte layers formed on the negative electrode face each other; and subjecting the wound electrodes to heat treatment at about 70°C so that the solid-electrolyte layers formed on the positive electrode and the negative electrode are integrated with each other into one continuous seamless layer. Although *Schneider et al.* teaches a secondary battery containing an electrode, the electrode is joined together with a separator (col. 2, line 62) and the separator is in contact with the electrode and *not* formed by the gel electrolyte layers on both sides (col. 8, lines 38-40) as embodied in claims 7 and 17.

Additionally, *Schneider et al.* discloses a vacuum process by forming a separator electrode structure that is immobilized on a drum vacuum surface and coated on a side of the separator with the second electrode slurry. (col. 8, lines 21-25). It fails, however, to disclose subjecting the wound electrodes to heat treatment at about 70°C so that the solid-electrolyte layers formed on the positive electrode and the negative electrode are integrated with each other into one continuous seamless layer. Thus, *Schneider et al.* 1) fails to teach forming solid-electrolyte layers on both sides of a positive electrode and a negative electrode to form a seamless layer; 2) fails to even relate heating wound electrodes at about 70°C so that the solid-

electrolyte layers formed on the positive electrode and the negative electrode are integrated with each other into one continuous seamless layer.

Gozdz et al. teaches formation of a unitary battery comprising separate steps of 1) first laminating a positive electrode member comprises two electrode composition layers; 2) then laminating a negative electrode member comprises two electrode; and 3) finally laminating the two together. (col. 3, lines 24-32). However, *Gozdz et al.* fails to teach a method of manufacturing a battery comprising winding the positive electrode and the negative electrode such that another one of the solid-electrolyte layers formed on the positive electrode and another one of the solid-electrolyte layers formed on the negative electrode *face each other*; and subjecting the wound electrodes to heat treatment at about 70°C so that the solid-electrolyte layers formed on the positive electrode and the negative electrode are integrated with each other into one continuous seamless layer. Although *Gozdz et al.* teaches a lamination step, it does not, in fact, teaches laminating the *whole* electrode component at once with the solid-electrolyte layers forming on both the positive and the negative electrodes. Lithium ions are allowed to move more efficiently and freely by winding and laminating the positive electrode and the negative electrode such that the solid-electrolyte layers formed are faced each other.

Also, contrary to the Examiner's argument, *Gozdz et al.* does not guide the artisan to use "lower" temperatures. Rather, *Gozdz et al.* teaches that when a one or a pair of electrodes that is about to be laminated, the cell current collector foil should be at a *preheat temperature* of 120° to 150° C. (Col . 2, line 4 and col. 5, lines 13-14). *Gozdz et al.* fails to teach subjecting the wound electrodes to a *heat treatment* at about 70°C so that the solid-electrolyte layers formed on the positive electrode and the negative electrode are integrated with each other into one continuous seamless layer. The heat treatment of the wound electrode integrates the gel electrolyte layer

form on the positive electrode and the negative electrode to enable more efficient lithium doping. Thus, *Gozdz el al.* 1) fails to teach winding the positive electrode and the negative electrode such that another one of the solid-electrolyte layers formed on the positive electrode and another one of the solid-electrolyte layers formed on the negative electrode *face each other*; and 2) fails to teach subjecting the wound electrodes to a *heat treatment* at about 70°C so that the solid-electrolyte layers formed on the positive electrode and the negative electrode are integrated with each other into one continuous seamless layer.

Kawakami et al. discloses a rechargeable battery comprising a positive and a negative electrode, an electrolyte in a housing where the positive electrode is larger than the negative electrode. However, *Kawakami et al.* fails to disclose winding the positive electrode and the negative electrode such that another one of the solid-electrolyte layers formed on the positive electrode and another one of the solid-electrolyte layers formed on the negative electrode face each other; and subjecting the wound electrodes to heat treatment at about 70°C so that the solid-electrolyte layers formed on the positive electrode and the solid-electrolyte layers formed on the negative electrode are integrated with each other into one continuous seamless layer. Although *Kawakami et al.* teaches that a rechargeable battery can be shaped in a spiral cylindrical form, it does not disclose or even suggest a winding of the positive electrode and the negative electrode such that another one of the solid-electrolyte layers formed on the positive electrode and the negative electrode face each other. In fact, *Kawakami et al.* disclose that the only the edge of the positive electrode shall be coated. (page 7, paragraph 0123). Thus, *Kawakami et al.* fails to disclose or even suggest winding the positive electrode and the negative electrode such that the solid-electrolyte layers formed on the positive electrode and the negative electrode face each other.

Therefore, one having skill in the art would not have been motivated to even combine *Narang et al.* in view of *Schneider et al.* in view of *Gozdz et al.* and further in view of *Kawakami et al.*, as all of the references fails to even relate to forming solid-electrolyte layers on both sides of a positive electrode and a negative electrode; laminating the positive electrode and the negative electrode such that one of the solid-electrolyte layers formed on the positive electrode and one of the solid-electrolyte layers formed on the negative electrode face each other; winding the positive electrode and the negative electrode such that another one of the solid-electrolyte layers formed on the positive electrode and another one of the solid-electrolyte layers formed on the negative electrode face each other; and subjecting the wound electrodes to heat treatment at about 70°C so that the solid-electrolyte layers formed on the positive electrode and the solid-electrolyte layers formed on the negative electrode are integrated with each other into one continuous seamless layer as disclosed in claims 7 and 17.

Further, *Narang et al.* is directed in making electrodes using a fire-retardant solvent. Therefore, one having skill in the art would not have been motivated to even combine *Narang et al.* in view of *Schneider et al.* in view of *Gozdz et al.* and further in view of *Kawakami et al.*, as none of the references fail to even relate to subjecting the wound electrodes to heat treatment at about 70°C so that the solid-electrolyte layers formed on the positive electrode and the solid-electrolyte layers formed on the negative electrode are integrated with each other into one continuous seamless layer. For at least these reasons, *Narang et al.* in view of *Schneider et al.* in view of *Gozdz et al.* and further in view of *Kawakami et al.*, fail to disclose or suggest claims 7 and 17.

Because "[B]oth the suggestion and the reasonable expectation of success must be found in the prior art, not in the applicant's disclosure," it is required that "particular findings must be

made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed." *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000). "[T]he factual inquiry whether to combine references must be thorough and searching. It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with." *In re Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002) (citations omitted).

The Office action fails to provide objective evidence of record of any suggestion or motivation in the prior art to combine and modify the cited references. It is now well-established that "[b]road conclusory statements regarding the teaching of multiple references standing alone are not 'evidence'." *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999); see also *In re Kotzab*, 217 F.3d at 1370. "Th[e] factual question of motivation is material to patentability, and [can] not be resolved on subjective belief and unknown authority." *In re Lee*, 277 F.3d at 1343-1344. Because the Office action fails to provide any objective evidence from the prior art of a motivation to modify and combine the cited references along with a reasonable expectation of success, Applicants respectfully submit that the Office action fails to state a prima facie case of obviousness but rather impermissibly relies upon hindsight in combining the various disparate references in contravention of the Federal Circuit's ruling. *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566 (Fed. Cir. 1996).

Additionally Applicants respectfully submit that the Examiner did not meet his burden to show that when the invention is considered as a whole and the references are considered as a whole, as required by law, that the prior art references teach or suggest all the claim limitations of Applicants' invention.

The rejections impermissibly cite different features of the claimed invention from prior art sources without the motivation or suggestion in the art to modify the references.

"It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that '[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.' *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992).

Applicants respectfully submit that current rejections function exactly in the manner the court in *In re Fritch* warns against.

"[The] Examiner must prove that it would have been obvious to modify the references, without having access to the application under examination to arrive at the claimed invention." *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 221 USPQ 1025, 1033 (Fed. Cir. 1984).

Accordingly, Applicants submit that none of the cited references, either alone or in any combination, teach each and every limitation found in claims 7 and 17, and specifically subjecting wound electrodes to heat treatment at 70°C so that the solid-electrolyte layers formed on the positive electrode and the solid-electrolyte layers formed on the negative electrode are integrated with each other into one continuous seamless layer.

Claims 8, and 10-16 all depend directly from claim 7 and are therefore allowable for at least the same reason that claim 7 is allowable.

As a result, Applicants respectfully request withdrawal of these rejections.

In view of the foregoing, Applicants submit that the application is in condition for allowance. Notice to that effect is requested.

Respectfully submitted,

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